

Appln. No. 09/882,472
Amendment dated Aug. 8, 2005
Reply to Office Action of June 9, 2005
Docket No. 6169-157

IBM Docket No. BOC9-2000-0016

REMARKS/ARGUMENTS

These remarks are made in response to the final Office Action of June 9, 2005 (Office Action). As this response is timely filed within the three-month statutory period, no fee is believed due.

Claims 1-22 were rejected at page 2 of the Office Action under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,078,886 to Dragosh, *et al.* (hereinafter Dragosh). Applicants respectfully maintain that the cited reference fails to disclose each feature of Applicants' invention. The differences between the cited reference and Applicants' invention are addressed herein, as is the response to Applicants' earlier arguments set forth at pages 3-4 of the Office Action.

It is stated at page 3 of the Office Action that with Dragosh "the type of grammar needed [for performing speech recognition] is determined, and [that] the location of the grammar itself is variable." It is further stated at pages 3-4 of the Office Action, that "Dragosh teaches the optionability of performing some of the speech recognition at the client to reduce bandwidth requirements and transmission times." Applicants respectfully submit that this is not Applicants' invention.

As explained herein, the distinction between Applicants' invention and Dragosh is not merely what type of speech grammar is to be processed, nor where a particular speech grammar is located. Instead, one difference lies in the invention's characterization of a grammar so as to permit a determination based on the characterization as to whether the speech grammar is to be processed locally on a client device, or, alternatively, on a speech server. Dragosh may include differently located speech grammars, but Dragosh does not disclose, for example, characterization of a grammar for determining alternative locations or where speech grammar processing will be performed. Dragosh may provide for performing feature extractions alternately at a server or its client, but speech grammar processing with Dragosh is inevitably performed at one location, the server.

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I. Applicants' Invention

Before specifically addressing Dragosh, and particularly those portions cited in the Office Action, it may be helpful to reiterate certain features of Applicants' invention. One aspect of Applicants' invention is a method for processing speech in a network-connected client device. The method can include selecting a speech grammar for use in a speech recognition system in the network-connected client device. The method also can include characterizing the selected speech grammar, and, based on the characterization, determining whether to process the speech grammar locally in the client device, or remotely in a network-connected speech server, as recited in independent Claims 1 and 10. (See also Applicants' Specification, p. 12, lines 14-22.)

Another aspect of Applicants' invention is a network-distributable speech grammar, the speech grammar being configured for distribution to network-connected client devices. The speech grammar can include a pre-determined characterization of the speech grammar (e.g., by marking the grammar). Moreover, the pre-determined characterization can be configured to selectively specify a preference for processing the speech grammar locally on a client device or, alternatively, processing the speech grammar remotely. (See also Applicants' Specification, p. 7, lines 16-23; p. 10, lines 5-26.)

Applicants' invention provides several advantages, especially when complex grammars are to be recognized on client devices constrained by low-processing power, such as a personal digital assistant (PDA), notebook computer, or mobile telecommunications devices. (See Applicants' Specification, p. 8, lines 2-4.). In this context, Applicants' invention provides that complex speech grammars are characterized or otherwise marked so that such speech grammars are processed at a network-connected speech server rather than in a speech engine that executes locally in a resource-

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constrained client device. (Applicants' Specification, p. 7, lines 11-13.) Conversely, less complex speech grammars are characterized or otherwise marked so that these speech grammars can be processed locally by the client device. (Applicants' Specification, p. 7, lines 13-15.)

Accordingly, with Applicants' invention, extensive resources of a network-connected speech server need not be deployed for processing less complex speech grammars since less complex speech grammars can be handled well enough by resource-limited client devices. The resources of a network-connected speech server are thus conserved, but remain available for processing complex speech recognition grammars tending to require the extensive processing resources that are typically only provided on a speech server.

II. Applicants' Invention Defines Over The Prior Art

Dragosh is directed to a system and method for automatic speech recognition using a client-server architecture that makes speech recognition services accessible at a client location remote from the location of the main speech recognition engine. Dragosh, however, does not disclose, for example, characterizing a speech grammar wherein the characterization determines whether to process the speech grammar locally in a client device or remotely in a speech server. In all instances, the speech grammar is processed at the server. There is no determination whether to perform the speech grammar processing locally, nor is there an option for doing so. As expressly stated, "[e]ither way, [the] client . . . sends the desired grammar file to the [speech recognition] server." (Col. 4, lines 57-62.)

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A. Differently located grammars does not teach applicants' invention

One embodiment of Dragosh, specifically referred to at page 3 of the Office Action, is cited as disclosing the use of grammars drawn from different locations. According to this embodiment of Dragosh, a client device receives a "grammar handle" from a server. (Col. 5, lines 45-48.) The client then returns the "grammar handle" to an application running on the client. (Col. 5, lines 47-53.) Subsequently, the client sends back to the server a "grammar identifier" for a "canned grammar" or a "URL address" of a file containing the grammar that is to be used. The server retrieves and loads the selected grammar for processing. (Col. 5, lines 53-56.)

Regardless of what Dragosh may teach regarding differently located grammars, however, this does not explicitly or inherently teach Applicants' invention. With Dragosh, whether the speech grammar is a "canned grammar" or one located at a specified URL address, the speech grammar is loaded on and processed by the server. (See FIG. 3.) Dragosh does not characterize the speech grammar so that a determination based on the characterization can be made as to whether to process the speech grammar at the client or the server, as recited in independent Claims 1, 10, and 14. With Dragosh the speech grammar regardless of the location from which it is retrieved is processed by the server. Accordingly, there is no opportunity to process less complex speech grammars by the client while processing more complex speech grammars by the server, as there is with Applicants' invention.

B. Separately performed feature extractions do not teach Applicants' invention

Another embodiment of Dragosh, which is referred to at pages 3 through 4 of the Office Action, is cited as disclosing the option to perform "some of the speech recognition at the client." This embodiment, however, does not disclose processing a

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speech grammar locally in a client or remotely in a server, as recited in independent Claims 1, 10, and 14. Instead of processing a speech grammar at a client, Dragosh speaks to performing "feature extraction" at the client. (Col. 8, lines 8-12.) Feature extraction constitutes front end signal processing for converting a speech signal into a sequence of feature vectors for classification. As such, feature extraction, is distinct from speech grammar processing. Feature extraction is a phase of speech recognition that precedes the latter processing of the grammar.

Dragosh is explicit on this very point in stating that the "[e]xtraction of relevant features from speech involves grammar-independent processing." (Col. 8, lines 29-41.) It remains, however, that the extracted features, although processed at the client, are transmitted to the server, which performs "speech recognition as features arrive." (FIG. 7, element 704; see also Col. 8, lines 45-49.) It follows that this embodiment does not expressly or inherently teach characterizing speech grammar so that a determination based on the characterization can be made as to whether to process the speech grammar at the client or the server, as recited in independent Claims 1, 10, and 14.

C. Dragosh fails to teach every feature of Applicants' invention

Applicants respectfully submit, therefore, that the reference fails to explicitly or inherently teach each of the features of Applicants' invention as recited in independent Claims 1, 10, and 14. For example, as described herein, Dragosh does not teach or suggest the selective performance of speech recognition either remotely at a server or locally by a network-connected client device. Neither does Dragosh teach or suggest determining whether to perform speech recognition locally or remotely based upon a pre-determined characterization that a speech recognition grammar can be configured to contain. Applicants respectfully submit, therefore, that the prior art fails to anticipate independent Claims 1, 10, and 14. The remaining claims each depend from one of these

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independent claims while reciting additional features. Accordingly, Applicants also respectfully submit that the prior art likewise fails to anticipate the remaining claims as well.

CONCLUSION

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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Gregory A. Nelson, Registration No. 30,577
Richard A. Hinson, Registration No. 47,652
AKERMAN SENTERFITT
Customer No. 40987
Post Office Box 3188
West Palm Beach, FL 33402-3188
Telephone: (561) 653-5000